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THE METAPHYSICAL ASPECT OF NATURAL HISTORY

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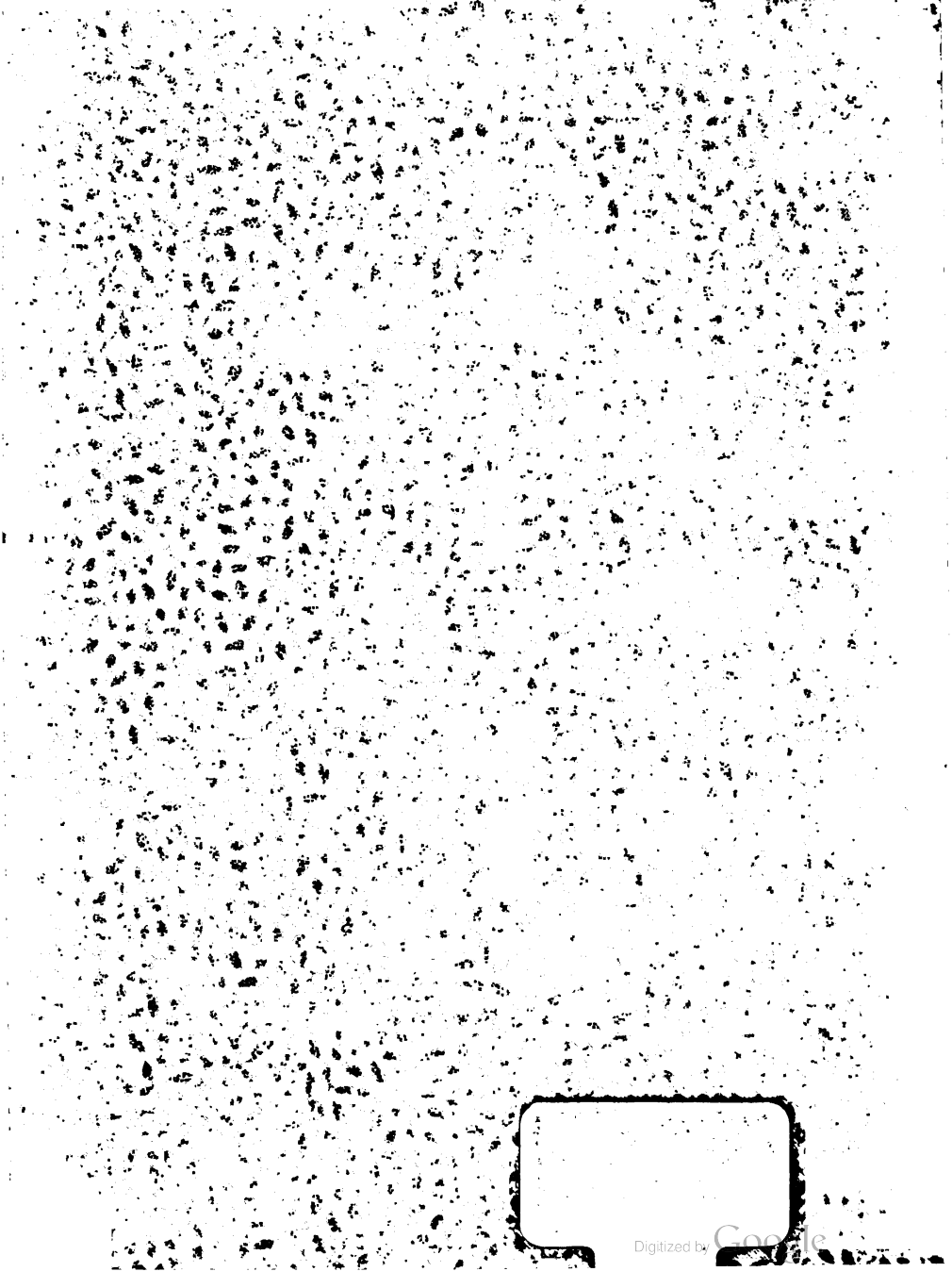
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THE

METAPHYSICAL ASPECT

OF

NATURAL HISTORY

AN ADDRESS

TO THE ROCHESTER NATURAL HISTORY SOCIETY

DELIVERED IN THE MATHEMATICAL SCHOOL, ROCHESTER

DECEMBER 10TH, 1884

BY

STEPHEN MONCKTON, M.D., F.R.C.P., ETC.

LONDON

H. K. LEWIS, 136 GOWER STREET, W.C.

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PREFACE.

THE object of the following lecture, or address, was to present to the members of a society, more or less conversant with natural science, this consideration; that an intelligent student may commence with a sure starting point, travel onwards from fact to fact, drawing only upon the resources of scientific observation and admitted history, and arrive at the following conclusions:—

1. That there is in nature an intelligent will-force.
2. That such intelligent will is the Author and Subject of the Bible.

If ever re-written, this crude report of an extempore address would need much clearing, and some extension, still, however, avoiding a voluminousness, that might easily prove fatal.

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The supreme purpose should be to provide young men, institutes and associations, with a definite skeleton, or ground work, of belief; from any point or portion of which a philosophic excursus might, of course, be made, but always without prejudice to the assured fixity of the foundation. Let it be seen and accepted finally that from London on definite rails, and by definite stations, you do arrive at York; let this certainty suffice for the more simple; while the learned, cleaving to it also, philosophise on the past, the future, and the surroundings of the line.

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THE METAPHYSICAL ASPECT

OF

NATURAL HISTORY.

MR. PRESIDENT, LADIES AND GENTLEMEN,

It is my privilege this evening to address a Natural History Society; one constituted to promote the study of natural objects, especially as they exhibit themselves about this town and neighbourhood. So far as may be judged from your Annual Soirées, replete alike with visitors and with interest, and from the Reports or Transactions that periodically arrive, your Association has neither existed nor laboured in vain.

The pursuit of Natural History demands observation, classification and interpretation. The first is the foundation-stone; and in very variable degrees of effectiveness does it occur. Our later lives are for the most part continuous demonstrations of the lessons we learned as children from Sandford and Merton, or Mangnall's Questions, or

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elsewhere, on the subject of "Eyes and no eyes;" so true is it that many see, yet see not, while others see and fail to understand. A good observer is rarely found, and when found he should not only be made a note of, but an example.

Classification stands fitly between observation and interpretation; it requires the co-operation of each; without the former we possess ourselves of nothing to classify, and without the latter we produce a mere schedule or list of things, instead of a catalogue raisonné, resting on essential and important characteristics. It would be an instructive task for a young member of your society to work up fully the classifications that have prevailed successively in Botany and Zoology; those for instance of Linnæus, Jussieu and De Candolle, of Cuvier, Grant and Owen; grasping the views which were associated with each arrangement, and the corrections that became called for, and applied, as knowledge grew at once more accurate and more wide. Do not regard classification as if it were an auctioneer's list, an enumeration of miscellaneous lots; it should rather be a well-assorted epitome of fundamental facts.

But unquestionably the hill of difficulty in

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natural science lies along the road of interpretation; the latitude for wandering is large, and the temptation to speculate is great; the student speedily drifts into a desert of conjecture, and finds the charts so numerous and conflicting, as to render his arrival in any particular port very much a matter of chance. Nevertheless it is this branch of the subject which we propose to think about to-night.

After the devotion of years to the observation of facts, to the accumulation of specimens and their assortment, it must be well for you to make a careful attempt to look behind them; to master not only the phenomena, their order and outcome, but to achieve a knowledge, if that be possible, of their originating influences. In our walks abroad, and in our museums, we come upon objects of amazing interest, beautiful and otherwise; farther consideration brings to light processes going on, and results wrought out, that it taxes our industry and acuteness to comprehend; many of them have been illuminated by brilliant efforts of genius, and lie unfolded by the labours of others to our gaze; many continue in obscurity, awaiting still the master's hand; but the largest

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number of all have been partially explained, presenting still material for further research. Some phenomena do seem to admit of final interpretation; we appear to be able to get through and behind them. Take fairy rings, as growing in a meadow; their circular shape, so long and so amusingly misunderstood, is no doubt due to the exhaustion of the little patch of soil under the parent fungus. Here is a picture of a vast mushroom; under the pileus, or cap, is shown the laminated hymenium, or collection of gills; upon these the spores, or seeds, are developed, and thence they shower down, in still weather and amid imbedding grass, upon the little round patch of ground about the stipes or stem. All the central spores reach ground that has been already exhausted for fungal purposes, by the mycelium, or root fibres, of the parent plant; those falling at or outside the circumference of the cap live and grow in unexhausted soil. The process repeats itself; the circular patch of sterilised ground increases by the width of each succeeding generation, till drought or low temperature brings their multiplication to an end. If this explanation be the correct one, it may be looked upon

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as exhaustive; there is nothing more to be said about it. The case is on all-fours with that of a tun of beer, or a vat of wine; once use up all the sugar by fermentation, and convert it into alcohol, and the yeast plant will forthwith refuse to grow. But in many another matter, one step is not sufficient for complete interpretation; the primary explanation leaves a difficulty still; we unravel the machinery, but fail to find the cause.

Two years ago I addressed you on the subject of shells, with especial reference to their shape and colouring. A painted shell, the cypræa or the nautilus, is to one man a thing of beauty and no more. Another will have learned with kindling interest how the spots are determined, how the colours are laid down, by the presence and action of pigment glands at regular intervals in the mantle, or secreting muscular membrane, by which the shell itself is built up; he will have found out that a spinous out-thrust of this membrane, coating itself with calcareous matter, brings about the long porcupine-like processes that characterize many shells, the formation of which may well be a puzzle to the every day observer. But when the mantle has been studied, and its

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faculty of depositing shell material pointed out, a difficulty still remains; what determines this arrangement? Why should the mantle secrete mortar-like masses with its edge, mother of pearl with its surface, and pigmentary colours by means of regular and equi-distant glands? Why should the result be uniform, and beautiful, and assured? Heat, chemical affinity, electric agency will do much, but there must be more; there is design, and a directive force must be at work.

Familiarity and habits of indolence, render us too little inquisitive, too easily satisfied with inadequate explanations. I invite you to consider with more thoroughness, that there must be a determining cause, a directive influence; which again must be in *pari materiâ*, if it may be so said of things immaterial, with the other agents that it is called upon to guide. We shall find design everywhere, and we shall find it wrought out by the operation of the correlated forms of force on matter; the design proves intelligence and will; and there must be some kinship, some nexus, between the will and the physical energies that it directs, or such direction would be impossible. No amount of wisdom could make a tree to grow,

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no intensity of love control a planet in its course, unless by the intervention of an apposite agent; the force which governs the efforts and issues of the correlated forces must itself be correlated with them.

Conscious that our work will be but sketchy and imperfect, let us hasten on to illustrate and establish these conclusions; endeavouring not only to show that such directive energy can be proved to be a necessity, but that it can be also identified and laid bare.

The general harmony of Nature, by its order proclaims that it has been ordered; by its fitness that it has been fitted. We need not accompany fully the old teleologic philosophers, or apply in all things the doctrine of final causes; we may admit that very much of what we see grows out of what has gone before it; we may admit, and must admit, the potent influences exerted by environment, heredity and adjustments, and yet we may decline to believe that Creation happened to be created; that all the complex magnificence of Nature came forth fortuitously, without the intervention of purposive and directing guidance, and that no designing and controlling will was con-

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cerned in the process, or led up to the results. Could such an anomaly be proved, it is certain that the human mind, as a whole, would fail to accept the teaching; much more may we decline to do so, when as we hope to show, not only is such proof wanting, but there is ample evidence the other way. Man knows by his own consciousness that adaptations presuppose design.

If we turn to the animal world in search of examples of the work of a determining agency, other than the mind of man or animal, we shall not seek in vain. Materialists tell us that mind is a secretion of the brain; that choice and free-will, and purposive adaptation cannot be produced, but through the agency of a brain, or some equivalent organ. The evident and complete association of mental effort with brain function in man, and in the higher animals, has given an excessive currency, and an undue sweep, to this conclusion. It has been too easily taken for granted, because conscious exercise of a directing will is dependent on cerebral agency in ourselves, that therefore no operation, including purpose, could be originated elsewhere. This will have to be reconsidered even in the

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higher animals. Too broad a line has been very probably drawn, even in man, between the brain and the spinal cord. The directivity of the brain is conscious, and palpable, and voluntary; hence it overshadows the lesser, hidden, and involuntary directivity exercised over organic life by the spinal cord and sympathetic ganglia.

There is more of genuine purposive directivity, of the nature of will-force, though exercised unconsciously, outside the brain than is supposed or taught; and this becomes important when it is our endeavour to trace directivity, as an operating force, in the department of physics.

The recent frog experiments may be familiar to some of you. A frog with its head off, and therefore not susceptible of pain, had the hollow of one thigh irritated by a drop of acid; by reflex action the foot on the same side was at once brought up, and used to brush away the irritant; that foot was next fixed, and the irritation to the thigh renewed; the other foot was immediately made use of. I argue that this implies a directivity, or will-force, other than that associated with either intellect or consciousness, a will-force which is none other than a vital and organising force, de-

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scending towards, and associating itself with, the physical forces. A will-force which first presides over the production of an organism, then imparts itself to the organism, energising and controlling its operations; conscious intellectual judgment being an occasional addition, an occasional phase, but not one that is indispensable.

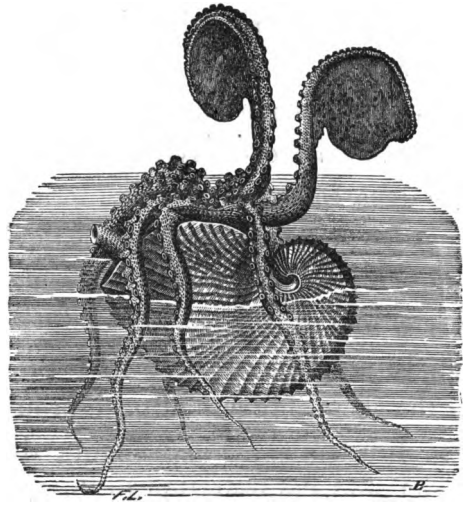

FIG. I.—Argonauta argo, the "Paper Nautilus" female.

You see here the diagram of an argonaut, shell, sails, and arms complete. Careful observation and experiment have led to the conclusion that

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fractures of the shell are repaired by the deliberate application of the expanded membranous sail, which secretes cement and heals the wound. If this be so, and if we remember that a human bone, when fractured, is also repaired by osseous cement, without any deliberation or knowledge of the patient, there is an illustration directly of the close alliance between the directivity exercised in an organism by the will of the individual, and the directivity which is born of unconscious endowment alone.

The next example we may cite of manifest response to a directive agency would naturally be that of Creation at large. Let it suffice, however, to beg that you will silently present this argument to your own minds.

No language of mine can equal your own experience of the glorious harmony that is; and no opportunity is afforded us now for tracing the orderly march by which the existing perfection of the universe has been reached. Bear in mind that science, and the still higher authority of Scripture, assure us that the commencement was rude undigested chaos, and that the former can only offer conflicting suggestions as to the

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authority, or great cause, which brought about such advanced developments.

We proceed then to elicit, from individual instances, evidence of purposive effort, that has no adequate organisation to account for it. The automatic operations of many animals are in reality evidence of this; the building of the bee, the migration of the swallow, the sucking of the new-born, the descent by heredity of parental qualifications, are all inexplicable, in the sense that there is no known or demonstrable machinery which can be shown to have produced them, and in the farther and important sense that not one of them could, for one moment, have been predicated *à priori*. As time and opportunity, and it must be confessed, insufficient preparation of this address, will disallow a very accurate and orderly treatment of the subject, let me thrust in here the remark, that one seeming confusion is deliberate and excusable, the confusion, namely, which speaks in one line of the directivity proved in the systematic and orderly production of beings, and in the next of the non-intellectual directivity which they in their own actions evince; for this is just what we are ask-

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ing you to believe, that of the great will-force, which, with his other attributes, constitutes the Creator, some is employed in producing, or in governing the production of, His creatures, some is allotted to the direction of their own proceedings when they are produced. By Him are all things, and in them He works. It is certain enough that in the breeding and development of the electric eel, electricity, or its equivalent is used up; it is equally certain that electricity is produced by the animal when mature. Organised beings are both the outcome of directive force, and the subsequent arena of its operations. Mr. Drummond would say spiritual beings are born of the Spirit, and are the subsequent arena of His operations.

Turn to this diagram, the original of which is a microscopic animalcule $\frac{1}{300}$ of an inch in diameter. It is an infusorial animalcule flourishing in a drop of dirty water. It is known to zoology as the Acineta, or the unmoved, because of its being anchored, as you see, by a long stem; in this case it is attached to a small filament of water-weed; it is adorned by bunches of tentacles or suckers, intended to entangle and secure its

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prey; among its ordinary victims are the Amœbæ, depicted here below, which succumb in numbers to the deadly embrace of these tentacles. The Amœba itself is a homogeneous atom of protoplasm;

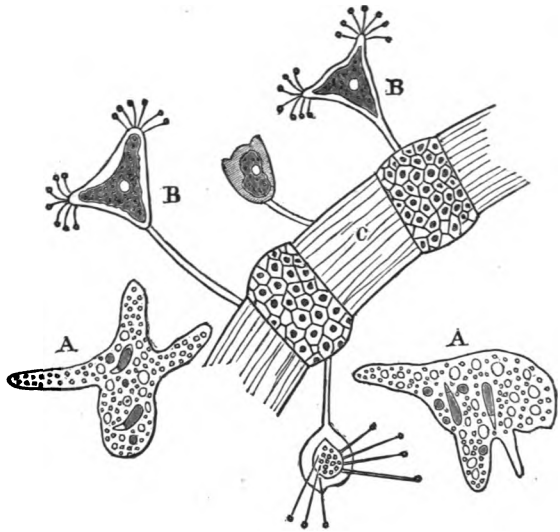

FIG. 2.—A. Amœba—B. Acineta—C. Water-weed.

in other words a spot of jelly, its name signifies "the changeable," for it really does not possess even a shape. It is a tiny dab, becoming within the space of half an hour round, triangular, and irregular; sometimes with finger like processes

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thrust out, sometimes with none. It too is predaceous; secures its prey, in the shape of ova, and minute living forms, or specks of organic matter, by wrapping it up within itself, possessing neither mouth for the reception of food, nor stomach; the involution and slow digestion of this food may be easily watched and studied under the microscope. Remember the utter want of organisation in the Amœba, it presents not even the most rudimentary brain, nor, so far as can be known, a nerve fibre, nor a ganglionic cell. Such then is the situation portrayed in the diagram; a comparatively well organised Acineta waving about in a drop of water, anchored by its stem, its shape and situation being wonderfully like a buoy; from these two points in the crown of the buoy, one on each side, diverge a fan-like bunch of tentacles with sucker-shaped extremities; down below, under the little fragment of water weed lie two Amœbæ; if the latter by flexions of, what may by courtesy be called their body, float away, they would almost certainly be apprehended by the tentacles now waving over their head, to be ingested by the Acineta. But a very different order of events has been actually

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seen to occur:—The Amœba travels slowly and insidiously up the stem of the Acineta, behind, and out of reach of, the tentacles; it embraces the apex of the body, the downward point of the buoy, and waits; shortly from this side aperture in the Acineta, begin to issue the bud-like young ones of the animalcule, on issuing they are at once appropriated by the Amœba, wrapped up, carried off and digested. Unless caught *on the spot*, the young would be floated actively away, and easily evade their would-be captor; unless the campaign were conducted on the dexterous principles we have described, the ingenious victor would have himself become the victim of the embracing tentacles. The purposive and well-directed character of this proceeding is remarkable, and not for a moment to be mistaken; and yet no mental organ exists to "secrete intelligence," nothing can be found or conceived capable by itself of developing so much of judgment and adaptation; the living speck must be actuated by its own minute share of a diffused will-force outside itself; just as a bar of iron becomes capable of special performances when possessed of a charge of magnetism, derived from the universal

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store of energy, which charge becomes for the time a property of its own matter, dependent upon the fitting condition of the matter, seeing that by heat the bar would cease to be magnetic, even as by damage the Amœba would cease to be fitted to exercise the attributes of either life or will.

It must not be supposed that the above interesting conduct of a living speck is very peculiar or unique; it is a strong case and has therefore been selected; but a dirty drop of water, with a solar microscope, will seldom fail to exhibit infusorial atoms demeaning themselves in the most volitional and enlightened fashion; a quiet contemplation of their proceedings will prepare any observer to admit the probability of the theory that their life history is but a prolongation of their production, that the will-force, the directive energy which planned and constructed them, is in fractional measure imparted to them, and continues to be the rule of their existence; to say that they derived their faculties by inheritance is surely nothing but a form of words, inheritance can be but a mode, not an effective cause, of such endowment; a series of bars may become magnetic

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by passing the charge on from one to the other; and in each case the power may be spoken of as derived by inheritance; but this does not explain the origin of the energy, nor forbid us to believe that the first bar drew its endowment from the pre-existing stores of energy in nature.

A medical man, of all beings, should be the last to call in question the marvellous results of hereditary influence, but the significance of such results may be misinterpreted. A planet explodes in space; hundreds of asteroids are scattered abroad; the path and the velocity of each one is determined by the antecedent conditionings of the parent orb; nevertheless the parent orb was after all only the medium through which the energies determining itself are eventually led to operate on its offspring. A directive force manifestly pre-existed the revolutions of the planet; the same continues to operate, *mutatis mutandis*, in the government of its progeny.

Vegetable physiology, again, supplies marked exemplifications of an outside energy directing the movements of matter. It signifies little that we may, or may not, be forced to admit that for the time, and for the purpose, the organised mat-

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ter itself may be "propertied" with the working force; while it is carrying a current, electricity dwells in, and characterises, a copper-wire; but electricity is by no means an inherent attribute of copper, nor a thing in any way derived from the nature or endowments of copper. It is a department of the universal self-existing "energy;" it imparts a fraction of itself to the copper in question, and leads on to results in harmony with its own laws of being; the matter, doubtless, by its kind affecting in some degree the conditions and the issue. Is not this, we are enquiring, precisely the case with life, and still more demonstrably with another department, or unit, of the universal energy, viz., will-force? Look at the analogy once more, a copper-wire lying on a table represents matter specially conditioned; it is matter endowed in a given way, up to a given point, it is copper;—under some determining influence, as that of the human will, it is next made part of a circuit, and an electric current flows through it, immediately it becomes an agent capable of performing feats, responding to opportunities, and conducting itself in a complex manner. It will induce another current in a separate wire placed

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near it; it will convert into a magnet a bar of iron round which it is coiled; it will select from the saw-dust of various metals poured over it the particles of iron, and reject the rest, investing itself with a powdery dress of iron filings, each particle a magnet; it will rise to the level of higher activities, and give off heat and light. But all these evolutions are only in a very secondary sense due to the properties of the matter wherein they are exhibited; we do not regard the performances of the acrobat as being properties of the trapeze, the rope, or the rings; so in the case of protoplasm, or living matter, the life energy is imparted from without, it is not a property of matter; on the contrary, matter affords only the scene and the machinery of its operations.

Mr. Darwin's volume on the *Movements of Plants*, (though so full of detail, and so occupied with numberless observations, as to make it difficult to abstract and crystallise his conclusions), seems to supply us with most useful material for study. On this diagram, Fig. 3, you see depicted the result of Mr. Darwin's experiment with the young shoot and radicle of the common broadbean. The bean was attached by a long pin to the cork

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of a large glass bottle, over, but not in, some water, the vapour of which promoted germination. Shortly the plumule shot upwards and the radicle downwards. To the latter, when about

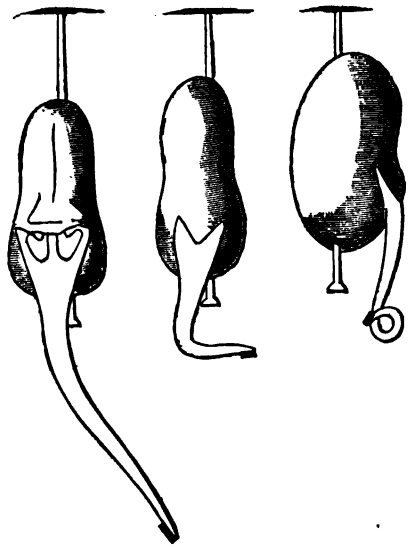

FIG. 3.—Broad bean, sprouting; showing tip curving to avoid obstacle, (*after Darwin*).

one inch long, a very minute patch of cardboard or shellac or tinfoil was attached, the same being fixed by a little adhesive cement, not always of the same sort, to one side of the tip of the rootlet;—

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observe that the whole hangs free in moist air; no possible pressure is brought to bear upon the rootlet; no thrust exerted which should dispose it to discontinue its steady and straight downward growth towards the water; but it does so discontinue, and turns immediately aside as if to avoid, and get round an impediment; but the impediment clings,

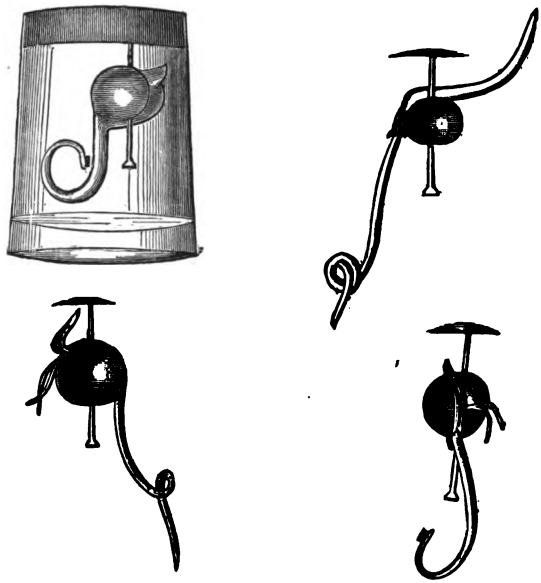

FIG. 4.—Sprouting Peas (*after Darwin*). In the first figure the glass is drawn on a reduced scale.

and follows the movement of deviation, which therefore has to be continued, till by a prolonged effort at avoidance, the rootlet is seen to grow side-

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ways, then upwards, then down again, till a curl (see fig. 4 of a sprouting pea) has been described, resembling the tail of a youthful pig. In another experiment a similar bean was planted in some very loose moist earth; and spread beneath the bean, at about two inches depth, was a thin soft little sheet of tin-foil; on reaching this the rootlet at once diverged, and commenced to grow horizontally, instead of downwards, as far as the edge of the tinfoil, after which it struck straight down again. So spontaneous was this process of accommodation, so little the result of pressure, or mechanical necessity, that the upper surface of the delicate metallic film was not grooved, or in any way marked, by the effort which the root might have been supposed to make in descending. As in the case of the rootlet in the bottle, so here, the phenomenon was due to a force of directivity, for which no physical cause or explanation could be found in the organs or their surroundings. True, there seems to have been a thickening, or extra deposit of nutritive material, in the cellular substance of the convex side of the rootlet, but that instead of solving the difficulty simply removes it by one step; why did one side grow more thickly than

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the opposite? Other indications are not wanting in the vegetable world of processes carried on by what is equivalent to instinct among animals. Professor Lindley used to describe the case of a small ash tree, struggling for life on the summit of an old wall; some feet below came to exist a cesspool, and sewerage soaked soil; the ash shot down a root, which implanted itself, and so progressed as to become eventually the practical stem of the whole tree.

Many of you, better botanists than myself, may be cognisant of the remarkable way in which vegetable roots seek for and select their food;—no doubt physical causes, such as moisture or direction of least resistance, play their part; but there are cases in which it seems clear that a special impulse is at work;—you perhaps may have studied more successfully than I have, the phenomena of geotropism and heliotropism, as experimented upon by Darwin and others; I unfortunately became soon lost and fatigued in the words, names, reiterations, and details of his most numerous and careful experiments; but they seemed to assure us that, as we had long learned to concede the possession of reason to animals, so we must

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now learn to admit the existence of instinct in plants. The recognition of a corresponding determining force in the case of crystals would cover the three kingdoms at once. That such determining energy is at work in the case of inanimate nature, we may be sure; the difference seeming to be this, that the great directing will-force moulds more absolutely the procedure of the inorganic world; less absolutely, and more mediately, departments wherein the introduction of instruments for self-use has taken place, and intervenes least of all, but still distinctly, in the highest forms, to which not only instruments, but an infusion of itself, as an independent will, has been imparted. For while the will-force operates upon its subjects, it imparts itself in varying measure to them in such sense that they become, *pro tanto*, self-determining. In proportion as a being has received the gift of will (including, as always, choice and judgment), does that being become independent of the external will-force, a free agent, and therefore responsible.

Surely, social and physical analogies are in harmony with this. The infant at first is managed absolutely by others, as it acquires an increasing

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stock of imparted judgment, and an organism more filled and fitted in respect of choice and will, so does the coercion from without diminish, and free agency, with responsibility, increase. Will is the consummation and expression of mental attributes, such as affection, intellect, and choice; so far as these antecedent contributories are possessed, so far is man endowed with an independent will of his own; there is still room, but less room, for the interference of a will other than his own. A half heated cannon ball in a dark room needs the addition of less energy to make it luminous than a cold one; the extent to which it has been already endowed determines the extent of its independence of farther external influence. The energy, you know, is motion; it is interesting to note that the effect of the operation of the outer energy upon the subject matter is also seen within it; there is an evoking within the body of vibrations and activities identical, or at least corresponding, with the vibrations and activities of the energy itself.

The view we have been suggesting that the phenomena of nature must be initiated, carried on and sustained by an outside energy correlated

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on the one hand with intellect, (because wisely directive), and bound up on the other hand with the physical forces, (because it acts with and by them), may, of course, be set down as superfluous and redundant. It may be said that there is neither necessity nor room for such a theory; that matter, by its inherent properties, is capable of evolving, combining, and metamorphosing all and every form in which we find it to exist. This has been argued by authorities entitled to respect; over and against such view we may set three considerations: first, that matter is also said to possess three characters only; extent, form, and inertia; out of these alone a variety of combinations can by no possibility be evolved, Secondly, that the theory rests upon allegation only, it is merely a formula expressing opinions, and does not even profess to produce a tangible and competent operating cause. Thirdly, our own will is the determining and conscious cause of many simple and complex results; hence analogy compels us to conclude that other similar results must be the issue of will and contrivance also. This last consideration appears conclusive likewise against the doctrine of necessity, which

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is contrary to consciousness; the works of man though causing effects, which, when their antecedents are assumed, may be called inevitable, the product of a necessity, are not so in their origin. Distinctly purposive eventualities, occurring among ourselves, are set down at once to the influence of will and judgment; we are bound to transfer the conclusion, under pain of wilful inconsistency, into the domain of nature; unless, of course, something more than a supposition can be set up against it. Extremists in the Necessitarian school would at once reply that man himself, his character and performances, were all the inevitable outcome of environments; that man too was the product and instrument of necessity. There can be nothing like a mind medically habituated to know how much of truth is interwoven with these opinions, and upon what important facts they rest. Still the opinions themselves are speculative; our consciousness resists the belief that they are wholly true; so long as we know ourselves free to choose at any time between A and B, we refuse to concede a necessity that A *must* be selected. Moreover, in what is offered as a very humble disquisition to-night to practical people,

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we need not lengthily refute in words what we every day repudiate in practice. No class of men, not even the philosophic, dreams of adopting in common life the necessitarian hypothesis. It may be worth while to add that even if under the pressure of facts very considerably strong, and at the instance of physiologic teaching unquestionably cogent, we *were* forced to conclude that man and his methods are but the necessary outcome of inheritances and surroundings, the simple creatures of circumstances, this would not compel us also to deny that the circumstances themselves took origin from intelligent and directive purpose. Even if crystallisation in the physical world were now going on *proprio motu*, and solely in virtue of its own characteristics, that would be insufficient to prove that crystallisation was not originally devised, and ordered, and started, by a Designer of wisdom and power; and it is this wisdom and will for which we are contending to-night.

Law is another formidable competitor for the honours of Creation. Much already said might be repeated here, as arguments to exclude this claimant also. Law *appears* to be almighty be-

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cause it fills our field of vision; it covers all the ground which we can explore, and extends into the past and future far beyond our ken; we cannot get behind it by any process of observation or research; for every test, and for all our apparatus of enquiry, it is prepared, and over every experiment it predominates. But this is not conclusive; the limit of our research is not the boundary of truth; it might well be said to us in accents of sublime rebuke: "Where wast thou when I laid the foundations of the earth? declare, if thou hast understanding. Knowest thou the ordinances of heaven? canst thou set the dominion thereof in the earth?"

To deal with Law we are bound to employ, not physical instrumentality, a witness already committed to the other side, but the one agent that is least of all under the domination of law, viz., our intellect; and if we operate on the problem by what is called pure reason, surely it is not difficult to discover that laws are only formulæ of recurrences; that not one of them can claim a *vis insita* or inherent potency; that they are processes, not powers; modes of operation, not themselves performers; grooves in which things

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move, under the impulse of an outside and independent mover.

It will go far to break the chains of law from off our necks, if we can adopt the views now being submitted to you. The stronghold of the prophets of law lies in this; that the forces of nature are seen and known to operate in an orderly fashion, the presence of system is not to be disputed, there is a *prima facie* case, a "nodus vindice dignus," but they forget the "deus intersit." Wild and ungoverned energy, or force, can hardly be conceived of as the parent of intelligent and harmonious results, hence they are driven to devise a cause of order, they find it in the harmony itself; an abstraction of consequences is exalted into a concrete cause, a conclusion *à posteriori* is transposed into an antecedent, and the progeny exhibited as the parent. But if we exclude as unsatisfactory and unproven the adequacy of the property of matter, of necessity, and of law, how may we otherwise explain the fact that the forces of nature are harmonised and regulated in their operations and in their ends? Surely by supposing that in the bundle of correlated forces, with the more immediate agents,

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such as chemical force, electricity, light, heat, and so forth, is bound up another, viz., will-force, which did determine, and is constantly determining, the operation of all the rest; or to phrase it more accurately, by supposing that the universal energy can manifest itself, or operate, not only as heat and light, but as life, mind and will, and possibly, though less conceivably, as love and moral force as well.

On a previous occasion we endeavoured to show the reasonableness of regarding life and mind as among the correlated forces, and dwelt upon the certainty that they were evolved at the expense of other forms of energy; the question of equivalence it was less easy to clear up. Very important is it, with scientific certainty to determine this point; to prove that will is so of the number of the modes of energy-manifestations that it *naturally*, not by *supernatural* or *miraculous* intervention, co-operates with and governs them. Very, very slowly did science unfold the constitution of the sun beam; actinic and parathermic rays lay hid for ages, lost in the greater and more practical prominence of light and heat. The learned judge who first grouped together the physical forces, as

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we now accept them, is still a living ornament of the bench; we may well, therefore, and fairly, hope to see that group made more inclusive, till every causative agent shall be intelligibly comprehended within it; till metaphysics shall be swallowed up in physics, and the supernatural shall be known no more. Of course the outside limits of nature will never be attainable to us while on earth, and many details of her various provinces will always remain to be searched out, but we shall know her in kind, if we fall short in perfectness and degree; the vast map before us may be beyond our powers to explore, but we shall know that every territory is *ejusdem generis* with the rest; there may be unreachable heights, and unfathomable depths, but there will be uniformity, not contradiction; we shall find that even in so-called miracle the Creator swerved not from His path, that he traversed none of His own laws, and violated in no way the continuity of His works.

At present, among much evidence that it would be unfair to quote, the only illustration I can offer of, what may be called generally, will-force, affecting immediately, *i.e.*, without the interven-

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tion of instruments, physical organisation, is the case of induced anæsthesia. Volumes of assertion are, of course, in print, setting forth mesmeric and spiritualistic prodigies without end, wherein inanimate bodies have been vigorously dealt with independently of any corporeal instrument; apparitional marvels abound, in connection with which some truth may yet come to be developed. Telepathy is under investigation, would that the pursuit were occupying abler hands, hands, *i.e.*, of more practised students of science; rare, vague, and uncatalogued though the wonders are, it may yet be proved that they are true; in which case light would be thrown on matters of infinite import, and niches filled up, now painfully vacant in the temple of knowledge.

The privation of feeling, or benumbing, of a patient by voluntary influence on the part of another is too well attested to be for a moment in doubt. I have seen the performance myself and tested very carefully the result. This is a physical effect produced by will-force, and therefore pertinent to our argument, it indicates a path along which further research is greatly to be desired; we need experimental proof that will-

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force can effect physical change, to crown the structure of our argument, which has hitherto been but too negative and inferential. Such proof is always tantalising us by presenting itself in abundant, and yet questionable shapes, one reads of will-force traversing space, and doors, and walls, and one longs to see it. There is enough of evidence and authority to influence our hopes, but not enough to afford scientific demonstration. Another effort it behoves us to make, and that is to identify this will-force, to distinguish it specifically in the work of the past, as having operated in and with and over the so-called forces of nature. Can this be done? The answer is in the affirmative, and to history we must apply. Long years ago there existed in Palestine a special people, firmly established in their own country, singularly distinct from their neighbours, and presenting every peculiarity required to render their study and observance easy and sure. A marked physical future was declared to be in store for them; not once, but repeatedly, at long intervals, and by different instrumentalities. Not in vague and Delphic terms, but in sentences pregnant with force, and insusceptible

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of misinterpretation, a future was set before them, real, substantive, open to every test of anthropologic science, a picture that must be verified or falsified, that must stand or fall. The people were to be *expatriated, dispersed, preserved.* If this came to pass indisputably, in full and fair fashion, there can exist, in a candid mind, no room for doubt that the intelligent force foretelling the process must be identical with that which accomplished the fulfilment of the same. But it did come to pass absolutely, and is being accomplished this day before our eyes. We may speak simply, and appeal to the personal knowledge and common sense of every hearer; is it not true that the history of the Jew, for 1800 years, has been an ethnologic marvel? a thing standing conspicuously apart? Is it not true that the distinctive features of that history coincide line by line, and angle by angle, when applied each to each, with the prophetic figures sketched by anticipation so long before? Can your sober judgment, or can anthropologic research on a more pretentious scale, can the discernment of the ordinary reader, or the utmost refinements of the best scientific testing that the circumstances admit,

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modify the facts or impugn the conclusion? Is it not historically certain that a will-force foretold occurrences, undertook to bring them about, and that they have been consummated? Do we not detect in operation here, what we have also traced elsewhere, an intelligent energy, possessing such a nexus with the other energies as to operate with them and to determine their results? Perhaps enough has been said, at this late period of the evening, to make clear the argument; but many of you will feel painfully what scant justice it has received. You will recollect how much more impregnable the position would have been rendered, if a fuller account were given of the prophecies and denunciations and promises on the one hand, and the extent and detailed accuracy of their fulfilment on the other. It may be thought for a moment, that this is not science; but science is not limited to the laboratory, nor are we, in our simple search after truth, debarred from the use of any reasonable form of evidence. The citation of history in the witness-box is justified by precedent; geologists in establishing the vicissitudes of land level, in respect to the sea, its submergence and emergence, argue from the wall

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of Antoninus in North Britain, and from the pillars of the old Temple of Serapis on the Mediterranean.

Jewish history supplies us with another, and even stronger, instance of what we are enforcing, the power of will-force and intelligence to influence and actuate physical issues, and the identity of that will-force with the agency that inspired the Bible. We are now answering the question whether this will-force can be identified with that at work in any known operations of the past. We find a reply in the physical history of Palestine. At a remote period, 3000 years ago, the country was glowingly described, as fertile, highly endowed, flowing with milk and honey, rich in the olive, the fig-tree and the vine. Two thousand years ago its utter desolation was foretold; not only the degradation and dispersion of its inhabitants, but the physical and agricultural destruction of itself; it was to become sterile and a desert. Of late years a scientific survey, high class in its character, and minute in its details, has been brought to bear upon the district; it is simply certain that the vines and the olives have departed; literally none are to be found; it is

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equally certain that they once abounded, for their semi-fossilised roots exist copiously, and are used extensively for fuel; and, overgrown, hidden away and desolate, are innumerable stone cisterns in the rocks, once used for the expression of oil and wine.* Unquestioned history and the best modern research show us distinctly:—1. A geographic district populous and fertile. 2. A declaration that this prosperity shall be brought to a violent end by the intervention of the foretelling intelligent will. 3. A tangible demonstration that the description of history was true, and that the purposed change has been brought about. How can we escape the inference that the same intelligent will-force has, by steady and irresistible operation on the minds and bodies of men, and upon the physical characteristics of the country, operated the issues that itself foretold. How far this may have been done by mediate or immediate process, for our purpose signifies naught; our very claim is that a will-force, outside the subject matter, must exist in such relation to all the other energies

* This argument, though with a slightly different purpose, is put with singular force in a little book entitled "*Witnesses for Truth*" by the Rev. Canon Hoare.

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quently find invested all the energies, whether those which affect animate, inanimate or intellectual subjects, in whom and by whom are all things.

In remote territories of Creation, He is expressed as directed physical force—possibly the avatar of deity in Heaven is love. So also with developments and differences in point of time; in early geologic days the Spirit brooded over a lifeless earth, but He wrought as a directive energy, or mind-force, upon the physically operating forces; and out of chaos proceeded harmony. To-day He has breathed into organised bodies a somewhat of Himself, and is brooding over a living and responsive world, too redolent however, of the grosser and material past; in the new Heavens and the new Earth old things shall have passed away, the chaos of darkness being once more transmuted into a realm of light.

Surely it may be claimed that Scripture confirms all this, that the Deity is therein represented as actually in all His works; as not only the law-giver of creation, but the law-force, without whose ceaseless sustentation and purposive interference, the laws themselves must certainly col-

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lapse. Have we sufficiently read into Scripture the mind of God in this respect? That anthropomorphism which Scripture itself recognises, and which we naturally exaggerate, is always presenting the idea of a maker outside his works, and a ruler overlooking his dominions; but this is only a form of speech necessitated by our feebleness, and substantially corrected by Scripture itself.

Certainly a difficulty exists in reconciling our proposed pantheistic view of the Creator with that personality of God, to which we properly cling, and the conviction of which we must in nowise relinquish; but the personality of God is at all times and to all theologians a mystery; we therefore *create* no new difficulty at all. Moreover the difficulty we meet with of reconciling our pantheistic presentation of God with the personality of Scripture, is but a counterpart of the reverse difficulty connected with Scripture itself, that, namely, of harmonising the eternity and omnipresence of the Creator with the conception of a person. It is no more hard of belief that an omnipresent universally operating Deity should be "personal," than it is to believe that a personal Deity should be universal and omnipresent.

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With the affections of the Deity, His love, wisdom, and justice, we presume not to deal, they lie at once without our province, and beyond our power; suffice it that their claims are unprejudiced by these suggestions.

The correlation of physical forces, on which we have based so much, though a truth experimentally proved, is not a truth that is exhausted, it may yet be expanded, and presented in different guise. Starting from motion as a fundamental form of force, variation of mode may be traced not only through heat, light, electricity and so forth, but, as we have argued now and on a previous occasion, through mind-force and its varieties, into the affections and feelings, and into ideation itself. Such an outcome is far more easy to conceive, than many extant philosophic hypotheses are to understand.

But we must end here. It has been our endeavour to show by the practice of simple observation, and the use of simple evidence, that there is in nature always, and everywhere, an acting force of directivity, not the primary product of the subject body, but part of the universal energy; so productive of designed results as to be clearly in-

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telligent, so incident upon the physical forces as to claim association with them, so at one with our own experience of will-force as to merit that designation, and so proved to be the energy that operated the prophecies and the miracles of Scripture that we identify it at once, and boldly, with the Almighty will of our Father and our God.

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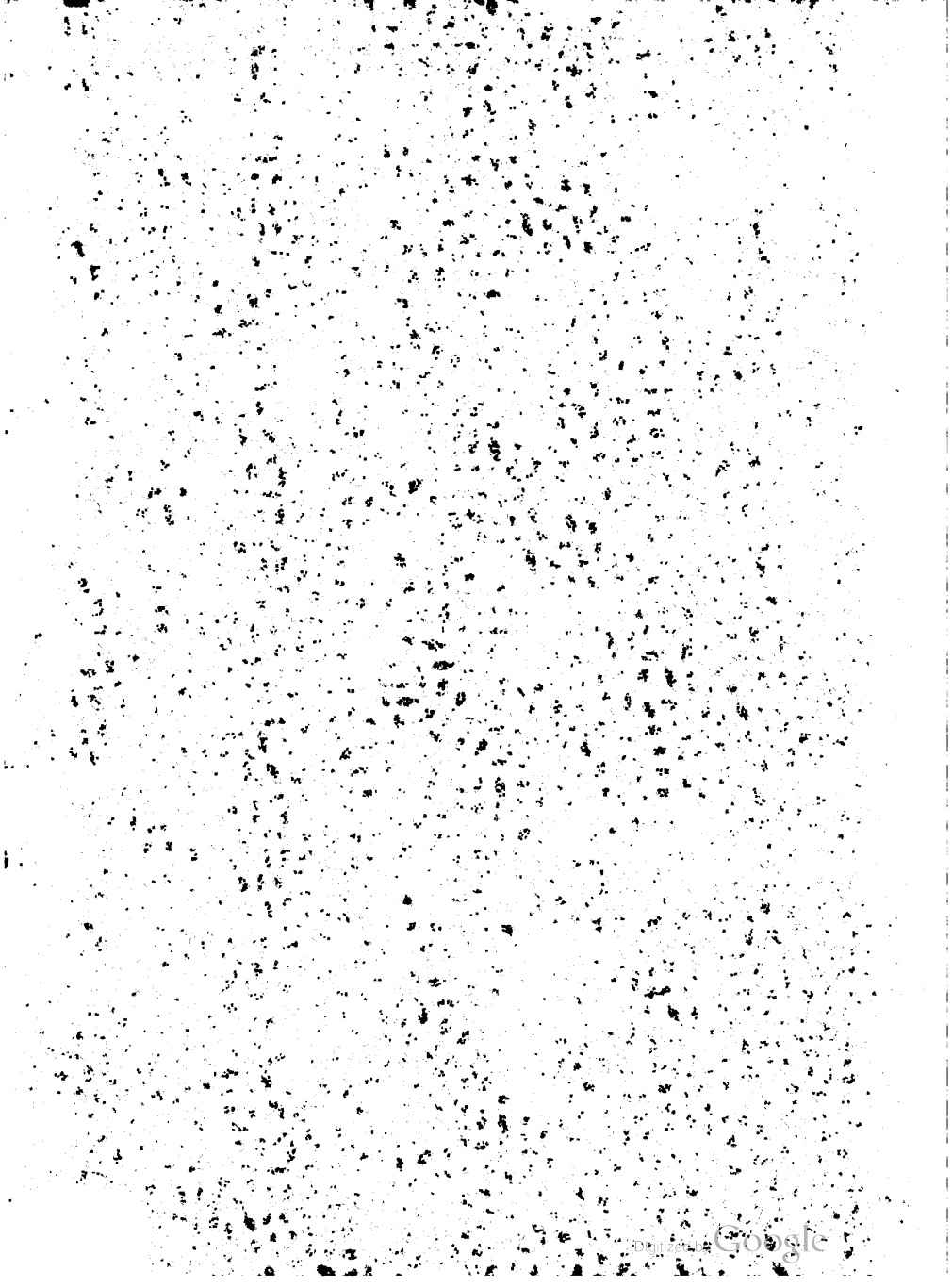
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